COURSE CODE	COURSE TITLE	L	T	P	C
PMA15204	ADVANCED OPERATIONS RESEARCH	4	1	-	4

INSTRUCTIONAL OBJECTIVES	
1.	Apply mathematical techniques to model and analyze decision problems
2.	Familiar with optimization techniques to solve real life problems
3.	Be exposed to determine the optimum level of inventory in manufacturing problems
4.	Be exposed to Non-linear programming problem and its applications
5.	Be thorough with solution dynamic programming problem

UNIT – I : LINEAR PROGRAMMING

Transportation problem – IBFS-VAM – Optimum solution (Modi method) – Degeneracy in TPP – Unbalanced TPP – Duality – Assignment problem – Travelling salesman problem.

UNIT – II : INTEGER PROGRAMMING

Dual Simplex method - Pure and mixed integer programming problems and applications – Gomory's cutting plane algorithm.

UNIT - III: INVENTORY MODELS

Deterministic models – single item static model without price breaks – probabilistic models – Single period problem with and without set-up cost.

UNIT – IV: NON LINEAR PROGRAMMING

Lagrangian multiplier method – Necessary and Sufficient conditions due to Kuhn Tucker – Quadratic Programming by Wolfe's Method.

UNIT – V: DYNAMIC PROGRAMMING

Characteristics of Dynamic Programming – Optimal subdivision problem - Solution of LPP by dynamic programming.

TEXT BOOK:

Kanti Swarup, P.K. Gupta, and Manmohan, Operations Research, 15th edition, Sultan Chand & Sons, Reprint 2009.

Unit I: Chapter 10: Sec 10.9, 10.12, 10.13, Chapter 5: Sec 5.2, 5.3,5.4, 5.7, Chapter 11: 11.1 – 11.7; Unit II: Chapter 5: 5.9; Chapter 7: Sec 7.1 - 7.4, 7.5, 7.6; Unit III: Chapter 19: Sec 19.10, 19.11; Chapter 20: 20.2, 20.4, 20.5 & 20.6; Unit IV: Chapter 27: Sec 27.3 – 27.5; Unit V: Chapter 13: Sec 13.3, 13.4 & 13.7

REFERENCES:

1. Frederick S. Hillier & Gerald J. Lieberman, Introduction to Operations Research, McGraw-Hill: Boston MA; 8th. (International) Edition, 2005.
2. Ravindran, Philips and Soleberg," Operations Research – Principle and Practice" Second Edition, John Wiley and sons, 2007.
3. Hadley.G, "Non-linear and dynamic programming", Addison Wesley, 1964.
4. Hira,Gupta "Operaions Research" S.Chand Limited, 2008.